

**IN THE CLAIMS**

Please replace all prior versions, and listings, of claims in the application with the following list of claims:

1-125. (Cancelled)

126. (New) A method, comprising:

- providing a semiconductor nanoscale wire;
- patterning a mask on the nanoscale wire to define at least a first portion not covered by the mask and a second portion covered by the mask;
- exposing the first portion but not the second portion to a bulk metal; and
- diffusing at least a portion of the bulk metal into the first portion of the nanoscale wire.

127. (New) The method of claim 126, wherein the semiconductor nanoscale wire comprises silicon.

128. (New) The method of claim 127, comprising diffusing at least a portion of the bulk metal into the first portion of the nanoscale wire to form a metal silicide having a stoichiometric ratio of silicon and at least one metal.

129. (New) The method of claim 128, wherein the metal silicide comprises nickel silicide.

130. (New) The method of claim 126, wherein the bulk metal comprises a transition metal.

131. (New) The method of claim 126, wherein the bulk metal comprises nickel.

132. (New) The method of claim 126, wherein the first portion of the nanoscale wire has a smallest dimension less than 200 nm.

133. (New) The method of claim 126, wherein the nanoscale wire is a single crystal.
134. (New) The method of claim 126, wherein the mask comprises photoresist.
135. (New) The method of claim 126, wherein the mask comprises a second nanoscale wire.
136. (New) The method of claim 135, wherein the second nanoscale wire comprises a core and a shell.
137. (New) The method of claim 126, wherein the nanoscale wire is a nanowire.
138. (New) The method of claim 126, comprising diffusing at least a portion of the bulk metal into the first portion of the nanoscale wire such that the first region has a resistivity of less than about 60 microOhm cm.
139. (New) The method of claim 126, comprising diffusing at least a portion of the bulk metal into the first portion of the nanoscale wire such that the first region is able to carry a current density of at least about  $10^8$  A/cm<sup>2</sup>.
140. (New) A method, comprising:  
    promoting a method comprising an act of diffusing at least a portion of a bulk metal into at least a portion of a semiconductor nanoscale wire, the bulk metal and the semiconductor nanoscale wire being adjacent, wherein the semiconductor nanoscale wire comprises at least one portion having a smallest dimension of less than about 500 nm.
141. (New) The method of claim 140, wherein the bulk metal comprises nickel.
142. (New) The method of claim 140, wherein the semiconductor nanoscale wire comprises silicon.

143. (New) The method of claim 140, comprising promoting a method comprising an act of diffusing at least a portion of the bulk metal into at least a portion of the semiconductor wire to form a metal silicide.
144. (New) The method of claim 143, wherein the metal silicide has a stoichiometric ratio of silicon and at least one metal.
145. (New) The method of claim 144, wherein the metal silicide comprises nickel silicide.